



CALS TEST NETWORK

AFCTN Test Report 93-022

AFCTB-ID
92-039



Multi-Volume Tape Transfer Test



Using:

Texas Instruments Data



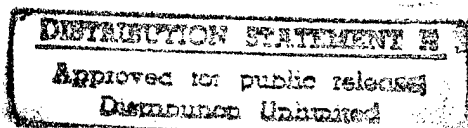
MIL-STD-1840A



Quick Short Test Report



28 July 1992



19960822 189



Prepared for
Electronic Systems Center

DTIC QUALITY INSPECTED 3

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28 Jul 1992

Prepared By

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1. Introduction

1.1 Background

The Department of Defense (DoD) Air Force Continuous Acquisition and Life-Cycle Support (CALS) Test Network (AFCTN) is conducting tests of the military standard for the Automated Interchange of Technical Information, MIL-STD-1840A, and its companion suite of military specifications. The AFCTN is a DoD sponsored confederation of voluntary participants from industry and government managed by the Electronic Systems Center (ESC).

The primary objective of the AFCTN is to evaluate the effectiveness of the CALS standards for technical data interchange and to demonstrate the technical capabilities and operational suitability of those standards. Two general categories of tests are performed to evaluate the standards; formal and informal.

Formal tests are large and comprehensive, which follow a written test plan, require specific authorization from the DoD, and may take months to prepare, execute, and report.

Informal tests are quick and short, used by the AFCTN technical staff, to broaden the testing base. they include representative samples of the many systems and applications used by AFCTN participants. They also allow the AFCTN staff to gain feedback from many industry and government interpretations of the standards, to increase the base of participation in the CALS initiative, and respond to the many requests for help that come from participants. Participants take part voluntarily, benefit by receiving an evaluation of their latest implementation (interpretation) of the standards, interact with the AFCTN technical staff, gain experience using the standards, and develop increased confidence in them. The results of informal tests are reported in Quick Short Test Reports (QSTRs) that briefly summarize the standard(s) tested, the hardware and software used, the nature of the test, and the results.

1.2 Purpose

The purpose of the informal test, reported in this QSTR, was to analyze Texas Instruments' interpretation and use of the CALS standards in transferring multi-volume tape data. Texas Instruments used its CALS Technical Data Interchange System to produce data, in accordance with the standards, and delivered it to the AFCTN technical staff on a 9-track magnetic tape. The data contained on the tape was not evaluated for this test.

2. Test Parameters

Test Plan: AFCTB 92-039

Date of
Evaluation: 28 July 1992

Evaluator: George Elwood
Air Force CALS Test Bed
HQ ESC/ENCP
Suite 200
4027 Col Glenn Hwy
Dayton OH 45431-1672

Data
Originator: Michael Hurn
Texas Instruments
M/S 8420
P.O. Box 869305
Plano TX 75086

Data
Description: Technical Manual Test
1 Document Declaration file
16 Initial Graphics Exchange Specification
(IGES) files
3 Raster files

Data Source System:

MIL-STD-1840A
HARDWARE
Sun 4/60
Cipher Data M995 GCR 9 Track Tape
SOFTWARE
Texas Instruments (TI) Tapetool v1.0

Evaluation Tools Used:

MIL-STD-1840A (TAPE)
SUN 3/280
AFCTN Tapetool v1.2.8 UNIX
AGFA Compugraphics CAPS/CALS v40.4
Cheetah Gold 486
USLynx 1840A Tape Handler
AFCTN Tapetool v1.2.8 DOS

Standards

Tested: MIL-STD-1840A

3. 1840A Analysis

3.1 External Packaging

The tape arrived at the Air Force CALS Test Bed (AFCTB) enclosed in a box in accordance with ASTM D 3951. The exterior of the box was marked with the magnetic tape warning label, as required by MILSTD-1840A, para. 5.3.1.3.

The tape was not enclosed in a barrier bag or barrier sheet material, as required by MIL-STD-1840A, para. 5.3.1.2. Inspection of the tape reel showed the required label indicating the recording density as required by MIL-STD-1840A, para. 5.3.1. Enclosed in the box was a packing list showing all files that were recorded on the tape.

3.2 Transmission Envelope

The 9-track tape received by the AFCTB contained MIL-STD-1840A files. The files were named per the standard conventions.

3.2.1 Tape Formats

This was the first multi-volume tape sent to the AFCTB.

The 1840A Tape was run through the AFCTN *Tapetool* v1.2.8 utility on the Sun 3/280. This utility was unable to handle the multi-volume tape set. It generated an error message at the end of the first tape.

The tape was also read using AGFA CAPS *read1840A* utility on the Sun 3/280. This utility was also unable to handle the tape.

The tape was read using the AFCTN *Tapetool* v1.2.8 for PC running a QualStar 9-track tape drive. This system was able to handle the tape with several reported problems. The problems were traced to the AFCTN *Tapetool*. This was the first test of the utility in the multi-volume mode and two minor bugs were found:

*** ERROR (ANSI X3.27; 8.3.1.1) - Columns 12-24 are reserved for future standardization and must be spaces.

*** ERROR (ANSI X3.27; 6.5.2) - Invalid file sequence number. File sequence numbers should increase by 1 for each file. Previous = 14; Expected = 15; Actual = 14

The tape was also read using USLynx *CALSTAPE* utility. This program was unable to read the tape. The problem was traced to the file naming convention used on tape. The USLynx software uses the name figid record for the name of the new file. Because all of the files had NONE as the value, the USLynx software could not handle any field beyond the first data file.

3.2.2 Declaration and Header Fields

No reported errors were found in the Document Declaration file or data record headers.

4. IGES Analysis

The IGES files were not evaluated for this test.

5. SGML Analysis

No Standard Generalized Markup Language (SGML) files were included on this tape.

6. Raster Analysis

The Raster files were not evaluated for this test.

7. CGM Analysis

No Computer Graphics Metafile (CGM) files were included on this tape.

8. Conclusions and Recommendations

In summary, the MIL-STD-1840A tape from Texas Instruments was basically correct. The tape could not be read properly using the AFCTN *Tapetool* v1.2.8 *UNIX* for unknown reasons. The PC version of the utility did read the tape correctly. The two other tape reading utilities in the test bed could not read the tape.

9. Appendix A - Tapetool Report Logs

9.1 Tape Catalog

Air Force CALS Test Network Catalog Evaluation - Version 1.2; Release Number 8

Standards referenced:

MIL-STD-1840A (1987) - Automated Interchange of Technical Information

ANSI X3.27 (1987) - File Structure and Labeling of Magnetic Tapes
for Information Interchange

ANSI X3.4 (1986) - Coded Character Sets - 7 Bit ASCII

Tue Jul 28 11:04:30 1992

MIL-STD-1840A File Catalog

File Set Directory: C:\TAPETOOL\SET004

Page: 1

File Name	File Type	Record Format/ Length	Block Length/Total	Selected/ Extracted
D001	Document Declaration	D/00260	02048/000001	Extracted
D001Q001	IGES	F/00080	02000/000257	Extracted
D001Q002	IGES	F/00080	02000/000257	Extracted
D001Q003	IGES	F/00080	02000/000257	Extracted
D001Q004	IGES	F/00080	02000/000257	Extracted
D001Q005	IGES	F/00080	02000/000257	Extracted
D001Q006	IGES	F/00080	02000/000257	Extracted
D001Q007	IGES	F/00080	02000/000257	Extracted
D001Q008	IGES	F/00080	02000/000257	Extracted
D001Q009	IGES	F/00080	02000/000257	Extracted
D001Q010	IGES	F/00080	02000/000257	Extracted
D001Q011	IGES	F/00080	02000/000257	Extracted
D001Q012	IGES	F/00080	02000/000257	Extracted
D001Q013	IGES	F/00080	02000/000253	Extracted
D001Q013	IGES	F/00080	02000/000003	Extracted
D001Q014	IGES	F/00080	02000/000257	Extracted
D001Q015	IGES	F/00080	02000/000257	Extracted
D001Q016	IGES	F/00080	02000/000257	Extracted
D001R017	Raster	F/00128	02048/000030	Extracted
D001R018	Raster	F/00128	02048/000030	Extracted
D001R019	Raster	F/00128	02048/000030	Extracted

Catalog Process terminated normally.

9.2 Tape Evaluation Log

Air Force CALS Test Network Tape Evaluation - Version 1.2; Release Number 8
Standards referenced:

ANSI X3.27 (1987) - File Structure and Labeling of Magnetic Tapes
for Information Interchange

ANSI X3.4 (1986) - Coded Character Sets - 7 Bit ASCII

Tue Jul 28 10:57:45 1992

ANSI Tape Import Log

Rewinding tape to load point...

VOL1CALS01 TI-TAPETOOL

4

Label Identifier: VOL1
Volume Identifier: CALS01
Volume Accessibility:
Owner Identifier:
Label Standard Version: 4

*** ERROR (ANSI X3.27; 8.3.1.1) - Columns 12-24 are reserved
for future standardization and must be spaces.

HDR1D001 CALS0100010001000000 92196 00000 000000TI-TAPETOOL

Label Identifier: HDR1
File Identifier: D001
File Set Identifier: CALS01
File Section Number: 0001
File Sequence Number: 0001
Generation Number: 0000
Generation Version Number: 00
Creation Date: 92196
Expiration Date: 00000
File Accessibility:
Block Count: 000000
Implementation Identifier: TI-TAPETOOL

HDR2D0204800260

00

Label Identifier: HDR2
Recording Format: D
Block Length: 02048
Record Length: 00260
Offset Length: 00

***** Tape Mark *****

Actual Block Size Found = 2048 Bytes.

Number of data blocks read = 1.

***** Tape Mark *****

EOF1D001 CALS0100010001000000 92196 00000 000001TI-TAPETOOL

Label Identifier: EOF1
File Identifier: D001
File Set Identifier: CALS01
File Section Number: 0001
File Sequence Number: 0001
Generation Number: 0000
Generation Version Number: 00
Creation Date: 92196
Expiration Date: 00000
File Accessibility:
Block Count: 000001
Implementation Identifier: TI-TAPETOOL

EOF2D0204800260

00

Label Identifier: EOF2
Recording Format: D
Block Length: 02048
Record Length: 00260
Offset Length: 00

***** Tape Mark *****

HDR1D001Q001 CALS0100010002000000 92196 00000 000000TI-TAPETOOL

Label Identifier: HDR1
File Identifier: D001Q001
File Set Identifier: CALS01
File Section Number: 0001
File Sequence Number: 0002
Generation Number: 0000
Generation Version Number: 00
Creation Date: 92196
Expiration Date: 00000
File Accessibility:
Block Count: 000000
Implementation Identifier: TI-TAPETOOL

HDR2F0200000080

00

Label Identifier: HDR2
Recording Format: F
Block Length: 02000
Record Length: 00080
Offset Length: 00

***** Tape Mark *****

Actual Block Size Found = 2000 Bytes.

Number of data blocks read = 257.

***** Tape Mark *****

EOF1D001Q001 CALS0100010002000000 92196 00000 000257TI-TAPETOOL

Label Identifier: EOF1
File Identifier: D001Q001
File Set Identifier: CALS01
File Section Number: 0001
File Sequence Number: 0002
Generation Number: 0000
Generation Version Number: 00
Creation Date: 92196
Expiration Date: 00000
File Accessibility:
Block Count: 000257
Implementation Identifier: TI-TAPETOOL

EOF2F02000000080

00

Label Identifier: EOF2
Recording Format: F
Block Length: 02000
Record Length: 00080
Offset Length: 00

***** Tape Mark *****

<<<< PART OF LOG REMOVED HERE >>>>

***** Tape Mark *****

HDR1D001Q013 CALS0100010014000000 92196 00000 000000TI-TAPETOOL

Label Identifier: HDR1
File Identifier: D001Q013
File Set Identifier: CALS01

File Section Number: 0001
File Sequence Number: 0014
Generation Number: 0000
Generation Version Number: 00
Creation Date: 92196
Expiration Date: 00000
File Accessibility:
Block Count: 000000
Implementation Identifier: TI-TAPETOOL

HDR2F0200000080

00

Label Identifier: HDR2
Recording Format: F
Block Length: 02000
Record Length: 00080
Offset Length: 00

***** Tape Mark *****

Actual Block Size Found = 2000 Bytes.

Number of data blocks read = 253.

*** ERROR (ANSI X3.27; 6.3.2.1) - Tape Mark expected.

***** Tape Mark *****

EOV1D001Q013

CALS0100010014000000 92196 00000 000254TI-TAPETOOL

Label Identifier: EOV1
File Identifier: D001Q013
File Set Identifier: CALS01
File Section Number: 0001
File Sequence Number: 0014
Generation Number: 0000
Generation Version Number: 00
Creation Date: 92196
Expiration Date: 00000
File Accessibility:
Block Count: 000254
Implementation Identifier: TI-TAPETOOL

*** ERROR (ANSI X3.27; 8.5.1.13) - EOV1 Block Count does not equal
to the actual block count. Expected => 254; Actual => 253

EOV2F0200000080

00

Label Identifier: EOV2

Recording Format: F
Block Length: 02000
Record Length: 00080
Offset Length: 00

***** Tape Mark *****

***** Tape Mark *****

End of Volume CALS01

Rewinding tape to load point...

Rewinding tape to load point...

VOL1CALS02 TI-TAPETOOL

4

Label Identifier: VOL1
Volume Identifier: CALS02
Volume Accessibility:
Owner Identifier:
Label Standard Version: 4

*** ERROR (ANSI X3.27; 8.3.1.1) - Columns 12-24 are reserved
for future standardization and must be spaces.

HDR1D001Q013 CALS0100020014000000 92196 00000 000000TI-TAPETOOL

Label Identifier: HDR1
File Identifier: D001Q013
File Set Identifier: CALS01
File Section Number: 0002
File Sequence Number: 0014
Generation Number: 0000
Generation Version Number: 00
Creation Date: 92196
Expiration Date: 00000
File Accessibility:
Block Count: 000000
Implementation Identifier: TI-TAPETOOL

*** ERROR (ANSI X3.27; 6.5.2) - Invalid file sequence number.
File sequence numbers should increase by 1 for each file.
Previous = 14; Expected = 15; Actual = 14

HDR2F02000000080

00

Label Identifier: HDR2
Recording Format: F

Block Length: 02000
Record Length: 00080
Offset Length: 00

***** Tape Mark *****

Actual Block Size Found = 2000 Bytes.

Number of data blocks read = 3.

***** Tape Mark *****

EOF1D001Q013 CALS0100020014000000 92196 00000 000003TI-TAPETOOL

Label Identifier: EOF1
File Identifier: D001Q013
File Set Identifier: CALS01
File Section Number: 0002
File Sequence Number: 0014
Generation Number: 0000
Generation Version Number: 00
Creation Date: 92196
Expiration Date: 00000
File Accessibility:
Block Count: 000003
Implementation Identifier: TI-TAPETOOL

EOF2F02000000080

00

Label Identifier: EOF2
Recording Format: F
Block Length: 02000
Record Length: 00080
Offset Length: 00

***** Tape Mark *****

<<<<< PART OF LOG REMOVED HERE >>>>>

***** Tape Mark *****

End of Volume CALS02

End Of Tape File Set

Rewinding tape to load point...

Tape Import Process terminated with 11 error(s), 0 warning(s),
and 0 note(s).

9.3 Tape File Set Validation Log

Air Force CALS Test Network File Set Evaluation - Version 1.2; Release Number 8
Standards referenced:

MIL-STD-1840A (1987) - Automated Interchange of Technical Information
MIL-R-28002 (1989) - Raster Graphics Representation In Binary
Format, Requirements For

Tue Jul 28 11:04:30 1992

MIL-STD-1840A File Set Evaluation Log

File Set: SET004

Found file: D001

Extracting Document Declaration Header Records...

Evaluating Document Declaration Header Records...

srcsys: Texas Instruments 6500 Chase Oaks Plano, Texas 75086 Mail Station 8420

srcdocid: AFCTN Test 11 and NWC Pretest 1

srcrelid: NONE

chglvl: ORIGINAL

dteisu: 19920714

dstsys: Air Force CALS Test Network AFLC/SJT WRIGHT-PATTERSON AFB, OH 44533-5001

dstdocid: NONE

dstrelid: NONE

dtetrn: 19920714

dlvacc: NONE

filcnt: Q16,R3

ttlcls: UNCLASSIFIED

doccls: UNCLASSIFIED

doctyp: Product Data

docttl: NONE

Found file: D001Q001

Extracting IGES Header Records...

Evaluating IGES Header Records...

srcdocid: NONE

dstdocid: NONE

txtfilid: NONE

figid: NONE

srcgph: NONE

doccls: UNCLASSIFIED

notes: NONE

Saving IGES Header File: D001Q001.HDR
Saving IGES Data File: D001Q001.IGS

<<<<< PART OF LOG FILE REMOVED HERE >>>>>

Found file: D001R017
Extracting Raster Header Records...
Evaluating Raster Header Records...

srcdocid: NONE
dstdocid: NONE
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: UNCLASSIFIED
rtype: 1
rorient: 000,090
rpelcnt: 003120,004200
rdensty: 0300
notes: NONE

Saving Raster Header File: D001R017.HDR
Saving Raster Data File: D001R017.GR4

<<<<< PART OF LOG FILE REMOVED HERE >>>>>

Evaluating numbering scheme...
No errors were encountered during numbering scheme evaluation.
Numbering scheme evaluation complete.

Checking file count...
No errors were encountered during file count verification.
File Count verification complete.

No errors were encountered in Document D001.

No errors were encountered in this File Set.

MIL-STD-1840A File Set Evaluation Complete.

9.4 USLynx Tape Log

3 entries

1. 07/28/92 11:11:11 DOC002 header
srcsys: Texas Instruments 6500 Chase Oaks Plano, Texas 75086 Mail Station 8420
srcdocid: AFCTN Test 11 and NWC Pretest 1
srcrelid: NONE
chglvl: ORIGINAL
dteis: 19920714
dstsys: Air Force CALS Test Network AFLC/SJT WRIGHT-PATTERSON AFB, OH 44533-5001
dstdocid: NONE
dstrelid: NONE
dtetn: 19920714
dlvacc: NONE
filcnt: Q16,R3
ttlcls: UNCLASSIFIED
doccls: UNCLASSIFIED
doctyp: Product Data
docttl: NONE
2. 07/28/92 11:11:14 D001 transferred as DCLRTION
3. 07/28/92 11:11:31 D001Q001 transferred as NONE

9.5 AGFA CAPS Log

```
read1840A: --- Read declaration file 'D001' ---
read1840A: writing data file 'aftb9239/NONE/NONE1.Q.igs'.
read1840A: writing data file 'aftb9239/NONE/NONE2.Q.igs'.
read1840A: writing data file 'aftb9239/NONE/NONE3.Q.igs'.
read1840A: writing data file 'aftb9239/NONE/NONE4.Q.igs'.
read1840A: writing data file 'aftb9239/NONE/NONE5.Q.igs'.
read1840A: writing data file 'aftb9239/NONE/NONE6.Q.igs'.
read1840A: writing data file 'aftb9239/NONE/NONE7.Q.igs'.
read1840A: writing data file 'aftb9239/NONE/NONE8.Q.igs'.
read1840A: writing data file 'aftb9239/NONE/NONE9.Q.igs'.
read1840A: writing data file 'aftb9239/NONE/NONE10.Q.igs'.
read1840A: writing data file 'aftb9239/NONE/NONE11.Q.igs'.
read1840A: writing data file 'aftb9239/NONE/NONE12.Q.igs'.
read1840A: writing data file 'aftb9239/NONE/NONE13.Q.igs'.
-- declaration file indicates 0 files of type T
-- declaration file indicates 0 files of type G
-- declaration file indicates 0 files of type H
-- declaration file indicates 16 files of type Q
-- declaration file indicates 3 files of type R
-- declaration file indicates 0 files of type C
-- declaration file indicates 0 files of type X
-- declaration file indicates 0 files of type P
-- declaration file indicates 0 files of type Z
*** WARNING: Declaration file indicates 16 IGES files, but tape contains 13 files.
*** WARNING: Declaration file indicates 3 Raster files, but tape contains 0 files.
```

9.6 AFCTN UNIX Tapetool Log

<<<< PART OF LOG REMOVED HERE >>>>

***** Tape Mark *****

HDR1D001Q013 CALS0100010014000000 92196 00000 000000TI-TAPETOOL

Label Identifier: HDR1
File Identifier: D001Q013
File Set Identifier: CALS01
File Section Number: 0001
File Sequence Number: 0014
Generation Number: 0000
Generation Version Number: 00
Creation Date: 92196
Expiration Date: 00000
File Accessibility:
Block Count: 000000
Implementation Identifier: TI-TAPETOOL

HDR2F0200000080

00

Label Identifier: HDR2
Recording Format: F
Block Length: 02000
Record Length: 00080
Offset Length: 00

***** Tape Mark *****

Actual Block Size Found = 2000 Bytes.

Number of data blocks read = 252.

*** ERROR (ANSI X3.27; 6.3.2.1) - Tape Mark expected.

*** FATAL ERROR (ANSI X3.27; 6.3.2.1) - ANSI Label HDR1 missing.

Deallocating /dev/rmt0...

Tape Import Process terminated with 3 error(s), 0 warning(s),
and 0 note(s).